CLAIMS

What is claimed is:

1. A remote tire monitor system comprising:

a plurality of tire monitors associated with wheels of a vehicle, each wheel including a tire having a characteristic frequency response, each tire monitor including a transmitter configured to transmit tire data at a transmission frequency chosen in relation to the characteristic frequency response of the tire; and

a receiver configured to receive the tire data.

2. The remote tire monitor system of claim 1 wherein the transmitter transmits at a transmission frequency in a passband of the characteristic frequency response of the tire.

3. The remote tire monitor system of claim 1 wherein the characteristic frequency response of the tire includes at least one passband and at least one attenuation band of frequencies and wherein the transmitter is designed to transmit at one or more transmission frequencies within the at least one passband for reliable communication of the tire data.

4. The remote tire monitor system of claim 1 where each tire monitor is mounted to a respective wheel of the vehicle inside a respective tire.

5. A tire monitor mountable inside a tire, the tire monitor comprising:

a tire data sensor; and

a transmitter configured to transmit tire data at one or more transmission frequencies chosen to be within a passband of frequencies of the tire.

6. The tire monitor of claim 5 wherein the tire has a characteristic frequency response including one or more attenuation bands and one or more passbands, the characteristic frequency response related to the structure of the tire, the

transmission frequency chosen to be in the one or more passbands.

7. The tire monitor of claim 6 wherein the tire includes radially positioned metallic strands of a predetermined length defining in part the characteristic frequency response of the tire, and wherein the transmitter is configured to transmit at a transmission frequency related to the configuration of the metallic strands.

8. The tire monitor of claim 6 wherein the tire includes circumferentially positioned metallic strands of a predetermined length and wherein the transmitter is configured to transmit at a transmission frequency having a wavelength substantially less than the predetermined length.

9. The tire monitor of claim 8 wherein the transmitter is configured to transmit at a transmission frequency greater than 600 MHz.

10. The tire monitor of claim 8 wherein the transmitter is configured to transmit at a transmission frequency in a range from 800 MHz to 1000 MHz.

11. The tire monitor of claim 5 wherein the tire is of a predetermined model and wherein the one or more transmission frequencies are chosen according to the predetermined model.

12. The tire monitor of claim 12 wherein the predetermined model has been characterized for frequency response, the frequency response including the passband of frequencies.

13. A method for operating a remote tire monitor system of a vehicle, the method comprising:

producing tire data indicative of a tire characteristic of a tire of the vehicle; and

using the tire data to modulate a radio carrier signal, the radio carrier signal having a transmission frequency chosen for reduced attenuation of the radio carrier signal by the tire.

14. The method of claim 13 further comprising:

receiving the radio carrier signal; and

demodulating the radio carrier signal to recover the tire data.

15. The method of claim 13 further comprising:

transmitting the radio carrier signal at a predetermined transmission power.

16. A method for selecting a transmission frequency for a tire monitor for use with a tire, the tire monitor communicating tire data to a remote receiver when mounted on the tire, the method comprising:

characterizing frequency response of the tire to radio transmissions of selected frequencies; and

selecting a transmission frequency for the tire monitor using the frequency response of the tire.

17. The method of claim 16 wherein characterizing the frequency response of the tire comprises:

identifying at least one attenuation band of frequencies of the tire; and

selecting the transmission frequency outside the at least one attenuation band of frequencies.

18. The method of claim 16 wherein characterizing the frequency response of the tire comprises:

identifying at least one passband of frequencies of the tire; and

selecting the transmission frequency within the at least one passband band of frequencies.

19. The method of claim 16 further comprising:

associating the selected transmission frequency with a tire model of the tire; and

selecting the transmission frequency for substantially all tire monitors for use with substantially all tires of the tire model

20. The method of claim 16 wherein selecting a transmission frequency comprises:

identifying one or more frequencies providing reliable transmission from the tire monitor to the remote receiver; and

tuning the tire monitor to transmit at the one or more frequencies.